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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/668,664	09/22/2000	Paul Petrus	015685.P068	2261
45222 7590 09/04/2007 ARRAYCOMM/BLAKELY 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040			EXAMINER THIER, MICHAEL	
			ART UNIT 2617	PAPER NUMBER
			MAIL DATE 09/04/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

09/668,664

**Applicant(s)**

PETRUS, PAUL

**Examiner**

Michael T. Thier

**Art Unit**

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 16-19, 25-27, 34, 35 and 39-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 16, 17, 25 and 34 is/are rejected.
- 7) ☒ Claim(s) 3, 18, 19, 26, 27 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-6, 16-19, 25-27, 34-35, and 39-43 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 5-6, 16-17, 25, 34, 39, and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun et al. (US 5886988) in view of Hoshino (US 6285891).

**Regarding claims 1, 16, 25 and 34.** Yun teaches a method of characterizing an environment (abstract), comprising:

receiving uplink signals from a plurality of antenna array elements (see figure 1 items 19 and 42);

estimating uplink spatial signatures from the received uplink signals (column 8 lines 67 to column 9 line 4); and

characterizing the environment based on the estimated uplink spatial signatures. (column 9 lines 38-58, i.e. determining the interference for a channel using the spatial

signatures reads on characterizing the environment, such as characterizing the environment as having interference.)

However, he does not specifically disclose that the environment being characterized is one of a plurality of predetermined environments.

Hoshino teaches a radio communication apparatus which has a plurality of communication functions (title and abstract). He discloses the idea of using operation modes based on a plurality of predetermined environments in column 19 lines 10-15.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to utilize the teachings of Hoshino with the teachings of Yun. The motivation for doing so would have been to allow for easily changing operation modes due to operation conditions based on a plurality of environments. (column 2 lines 45-48)

**Regarding claim 2.** Yun further teaches wherein estimating uplink spatial signatures comprises: estimating an uplink spatial signature of the received uplink signals; and calculating a geometric uplink spatial signature of the received uplink signals. (see column 9 lines 1-30)

**Regarding claim 5.** Yun further teaches wherein finding the correlation between the estimated uplink spatial signature and the geometric uplink spatial signature comprises calculating a normalized dot product of the estimated uplink spatial signature and the geometric uplink spatial signature. (column 9 lines 23-37)

**Regarding claim 6.** Yun further teaches wherein estimating the uplink spatial signature of the received uplink signals comprises calculating a correlation vector

between the uplink signals received by the plurality of antenna array elements and a reference signal. (column 4 lines 65 to column 5 line 25)

**Regarding claim 17.** Yun further teaches a memory coupled to the receive and the signal processor to store uplink signals received from the plurality of antenna elements. (column 9 lines 12-17)

**Regarding claim 39.** Yun further teaches wherein the uplink signals are included in a spatial division multiple access (SDMA) communications system. (column 8 lines 64-65)

**Regarding claim 42.** Yun further teaches wherein the uplink signals are received by the plurality of antenna array elements from one or more remote terminal. (figure 1)

**Regarding claim 43.** Yun further teaches wherein the plurality of antenna elements comprise a handset. (figure 1 items 20, 22, or 24)

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the grounds of rejection as applied to claim 2 above, and further in view of Friedlander et al. (WO 00/35129).

**Regarding claim 4.** Yun and Hoshino teach the limitations of the previous claims.

However they do not teach the limitations in this claim.

Friedlander teaches a channel estimation method and system for fast fading environments (title and abstract). He further teaches wherein calculating the geometric

uplink spatial signature comprises: estimating a dominant angle of arrival of the uplink signals received by the plurality of antenna array elements; calculating an uplink spatial signature of the received uplink signals using the estimated dominant angle of arrival.  
(see pg 7-8)

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to utilize the teachings of Friedlander with the teachings of Yun and Hoshino. The motivation for doing so would have been to allow for less interference and noise in the system (Friedlander pg. 9 lines 1-2).

5. Claims 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the grounds of rejection as applied to claim 1 above, and further in view of Liu et al. (US 6122260).

**Regarding claim 40.** Yun and Hoshino teach the limitations of the previous claim.

However, they do not specifically disclose wherein the uplink signals are included in a time division duplex (TDD) communications system.

Liu teaches these limitations in column 3 lines 28-35.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to utilize the teachings of Liu with the teachings of Yun and Hoshino. The motivation for doing so would have been improved system capacity (Liu, column 3 lines 33-36).

**Regarding claim 41.** Liu further teaches wherein the uplink signals are included in a frequency division duplex (FDD) communications system. (column 2 lines 55-57)

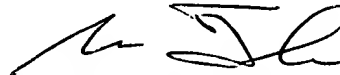
***Allowable Subject Matter***

6. Claims 3, 18-19, 26-27, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael T. Thier whose telephone number is (571) 272-2832. The examiner can normally be reached on Monday thru Friday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc Nguyen can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael T Thier  
Examiner  
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8/22/2007



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